

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos were observed in the various states and territories during the month, as follows:

Alabama.—11th, 16th.
Arizona.—30th.
California.—3d, 7th, 8th, 13th, 15th, 16th, 21st, 22d, 27th, 28th, 30th, 31st.
Colorado.—7th, 26th, 29th.
Dakota.—8th, 9th, 11th, 15th, 27th, 29th.
Florida.—6th, 20th.
Georgia.—2d, 8th, 11th.
Idaho.—10th, 19th.
Illinois.—3d, 14th, 17th, 18th, 24th, 25th, 27th.
Indiana.—3d, 4th, 7th.
Iowa.—2d, 4th, 20th, 21st.
Kansas.—7th, 19th.
Kentucky.—9th.
Maine.—8th, 19th.
Maryland.—24th, 25th, 27th.
Massachusetts.—8th, 18th, 24th, 26th, 27th.
Michigan.—11th, 12th, 14th, 15th, 22d, 23d, 24th, 28th.
Minnesota.—3d, 16th, 24th, 26th.
Missouri.—8th.
Montana.—27th.
Nebraska.—31st.
New York.—8th, 11th, 15th, 20th, 25th, 27th, 28th, 29th.
North Carolina.—4th, 8th, 12th, 15th, 16th, 26th, 29th.
Ohio.—5th, 7th, 11th, 13th, 14th, 17th, 19th, 24th to 28th.
Oregon.—15th, 16th, 31st.
South Carolina.—3d, 4th, 5th, 8th, 25th, 26th, 27th, 30th.
Tennessee.—2d, 4th, 8th, 11th, 16th, 17th, 18th, 25th.
Utah.—22d.
Vermont.—25th, 27th.
Virginia.—9th, 10th, 16th.
Washington Territory.—1st, 7th, 24th, 31st.
Wisconsin.—3d, 12th, 13th, 17th.
Wyoming.—1st, 7th, 9th, 11th, 20th, 21st, 28th, 29th.

LUNAR HALOS.

Lunar halos were observed in the various states and territories, as follows:

Alabama.—16th.
Arizona.—14th, 16th, 17th, 22d, 23d, 24th.
California.—14th, 16th, 17th, 19th to 23d, 27th.
Colorado.—11th, 16th.
Connecticut.—11th, 15th.
Dakota.—15th, 16th, 17th.
District of Columbia.—12th, 18th, 19th.
Florida.—11th, 19th.
Georgia.—10th, 11th, 19th.
Idaho.—17th, 20th.
Illinois.—13th, 17th, 18th, 19th, 24th.
Indiana.—13th, 17th, 18th, 19th.
Iowa.—14th, 16th, 19th, 20th.
Kansas.—7th, 16th, 18th, 21st, 22d.
Kentucky.—16th, 17th, 19th.
Louisiana.—18th.
Massachusetts.—8th, 11th, 14th, 18th, 19th.
Michigan.—12th, 14th, 16th to 19th, 22d, 24th, 25th.
Minnesota.—14th.
Missouri.—18th, 19th.
Montana.—15th, 17th, 18th, 20th.
Nebraska.—11th, 12th, 15th, 16th.
Nevada.—16th.
New Hampshire.—14th.
New York.—11th, 13th, 14th, 17th.
North Carolina.—16th.
Ohio.—11th, 13th, 17th, 18th, 19th, 24th.
Pennsylvania.—11th, 15th, 16th, 18th.
South Carolina.—11th, 16th, 19th, 25th.
Tennessee.—14th to 19th.

Texas.—9th, 10th, 13th to 21st.

Utah.—22d.

Vermont.—11th, 17th, 18th.

Virginia.—5th, 9th, 11th, 12th, 15th to 19th.

Washington Territory.—10th, 16th, 18th, 20th.

Wisconsin.—5th, 13th, 17th.

Wyoming.—11th, 15th.

The phases of the moon during March were: new moon, 5th, 5.04 p. m.; first quarter, 13th, 8.17 a. m.; full moon, 19th, 11.36 p. m.; last quarter, 26th, 5.44 a. m.; apogee, 1st, 11.15 a. m.; perigee, 17th, 5.14 a. m.

MIRAGE.

Indianola, Texas, 5th, 17th, 22d

Salina, Kansas, 8th, 9th, 31st.

Webster, Dakota, 16th, 22d, 30th.

Traverse City, Michigan, 23d.

Stowe, Vermont, 27th.

MISCELLANEOUS PHENOMENA.

SUN SPOTS.

Prof. David P. Todd, director of the Lawrence Observatory, Amherst, Massachusetts, furnishes the following record of sun spots for March, 1886:

Date— March, 1886. Standard time.	No. of new.		Disappeared by solar rotation.		Reappeared by solar rotation.		Total No. visible.		Remarks.
	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	
1, 1 p. m....	1	20†	0	0	5	65†	Broad areas of faculae. Do.
2, 2 p. m....	0	10†	0	0	.....	.....	5	75†
4, 12 m....	4	40†	.....	.....	4	15†	8	110†
5, 4 p. m....	1	60†	0	0	0	10†	9	170†	
6, 5 p. m....	0	0	0	0	0	0	8	160†	
7, 4 p. m....	0	0	1	10†	0	0	6	130†	Broad areas of faculae. Do.
10, 10 a. m....	0	0	.....	.....	0	0	5	85†
14, 10 a. m....	0	0	.....	.....	0	0	3	20†
15, 4 p. m....	0	0	1	15†	0	0	2	5	
16, 5 p. m....	1	5	1	2	0	0	2	1	
17, 4 p. m....	0	9†	1	3	0	0	1	15†	
23, 4 p. m....	4	30†	.....	.....	3	20†	5	35†
24, 5 p. m....	0	10†	0	0	.....	.....	5	45†
26, 10 a. m....	1	5†	.....	.....	.....	.....	4	30†
28, 10 a. m....	0	25†	0	0	.....	.....	4	55†

Faculae were seen at the time of every observation. 1 Approximated.
 Note.—From the 6th to 16th, one of the spots very large.

Mr. H. D. Govey, of North Lewisburg, Champaign county, Ohio, reports having observed sun spots on the following dates: 1st, 3d, 4th, 6th, 10th, 12th, 15th, 17th, 18th, 19th, 23d, 24th, 31st.

SUNSETS.

The characteristics of the sky, as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service stations. Reports from one hundred and sixty-two stations show 5,019 observations to have been made, of which four were reported doubtful; of the remainder, 5,015, there were 4,416, or 88.1 per cent., followed by the expected weather.

EARTHQUAKES.

Butlerville, Jennings county, Indiana: a distinct shock of earthquake was felt about 10 a. m. of the 1st, lasting ten seconds; vibrations from northeast to southwest.

Makanda, Jackson county, Illinois: an earthquake shock occurred at 11.59 p. m. of the 17th, which was generally felt throughout the county.

Cairo, Illinois: a heavy shock of earthquake was felt at 11.15 a. m. of the 18th, lasting about fifteen seconds; vibrations from west to east; no damage was reported.

PRAIRIE FIRES.

Prairie fires were reported from the following stations:

Arkansas.—Fort Smith, 16th, 17th.

Dakota.—Yankton, 24th.

Indian Territory.—Fort Reno, 4th, 5th, 10th to 18th, 20th to 26th, 28th, 31st; Fort Sill, 5th, 8th, 10th to 13th, 17th to 26th; Fort Supply, 17th, 22d.

Kansas.—Concordia, 23d, 24th, 26th.

Montana.—Fort Keogh, 26th.

Nebraska.—Hay Springs, 23d; Meade, 24th.

Texas.—Fort Elliott, 14th to 26th; Abilene, 19th to 23d; Midland, 19th to 23d, 31st.

FOREST FIRES.

Cape Henry, Virginia, 25th.

Stateburg, South Carolina, 23d, 24th.

METEORS.

The following is from the "New York Herald" of March 2, 1886:

TRUMANSBURG, NEW YORK, *March 1, 1886.*—An unusually brilliant meteor was observed here this morning at a quarter past six o'clock during the prevalence of a gale and fall of fine snow. So remarkable, however, was the meteor that, although within twenty minutes of sunrise, it was plainly visible, notwithstanding the twilight and snow. Its path began at a point about a third of the way up from the horizon to the zenith, a little north of west, and ended low down in the southwest.

Wauseon, Fulton county, Ohio: a meteor was observed at 8.10 p. m. of the 16th, lasting about three seconds. It moved from the west, with a trail of light and smoke about 8° long; when about 25° west, of the zenith it burst into three parts. The color was a pale yellow before bursting, after which it was tinged with blue. The smoke and trail were visible about half a minute after the disappearance of the meteor.

Flora, Clay county, Illinois: a large meteor was observed on the 17th, moving in a straight line from east to west at an altitude of about 36°.

Cairo, Illinois: a bright meteor, with a trail of about 20°, was observed at 7.30 p. m. of the 17th. It started at an altitude of 45° above the eastern horizon and moved slowly towards the west; as it passed the zenith it burst into several pieces, making a vivid light, and changed its color to a bright orange. It disappeared at an altitude of 50° above the western horizon.

Meteors were also reported in the various states and territories, as follows:

Connecticut.—New Haven, 1st.

Illinois.—Eberle, 2d; Beardstown, 3d; Philo, 16th; Anna, 17th; Charleston and Mason City, 23d; Makanda, 25th.

Iowa.—Monticello, 27th; Oskaloosa, 16th.

Kansas.—Elk Falls, 24th.

Maryland.—Woodstock, 2d, 3d, 4th, 6th.

Minnesota.—Spring Valley, 16th.

Missouri.—Warrenton, 16th.

New Jersey.—Beverly, 4th, 6th; Dover and Egg Harbor City, 5th.

New York.—Mountainville, 6th.

Oregon.—Albany, 2d.

Pennsylvania.—Bethlehem, 5th; Fallsington, 10th.

Virginia.—Dale Enterprise, 18th, 23d.

Wyoming.—Fort Bridger, 8th.

POLAR BANDS.

Florida.—Archer, 6th, 30th.

Illinois.—Riley, 28th.

Kansas.—Ninnescah, 13th, 14th, 17th, 18th, 22d.

Maine.—Portland, 2d, 24th.

New Jersey.—Moorestown, 1st.

Ohio.—Wauseon, 11th, 17th, 24th; Napoleon, 13th, 17th.

Tennessee.—Nashville, 2d, 8th, 11th, 16th, 17th.

Texas.—El Paso, 16th, 27th, 31st.

Virginia.—Wytheville, 2d, 4th; Dale Enterprise, 5th, 24th.

Washington Territory.—Bainbridge Island, 27th.

Wisconsin.—Prairie du Chien, 25th.

Wyoming.—Fort Bridger, 21st.

SAND STORMS.

Yuma, Arizona, 9th, 10th, 18th.

El Paso, Texas, 10th, 18th, 26th.

Maricopa, Arizona, 10th.

Willcox, Arizona, 27th, 28th.

MIGRATION OF BIRDS.

Geese flying northward.—Wyandotte, Kansas, 1st; Yates

Centre, Kansas, 1st, 12th; San Antonio, Texas, 4th; Anna, Illinois, 4th, 13th; Independence, Kansas, 5th, 8th; Cedar Rapids, Iowa, and Garrettsville, Ohio, 6th; Wakefield, Kansas, 6th, 15th, 22d, 24th; Corsicana, Texas, Wytheville, Virginia, and Ocean City, Maryland, 7th; Portland, Oregon, 7th, 12th, 14th; Westmoreland, Kansas, 8th, 12th; Chicago, Illinois, 11th; Spartanburg, South Carolina, 12th; Fort Sill, Indian Territory, 12th, 13th, 25th; Lamar, Missouri, 12th, 28th; Salina, Kansas, 13th, 15th, 18th, 23d; Yutan, Nebraska, 13th, 18th; Indianola, Texas, 14th, 18th; Manchester, Iowa, 15th; Wellsborough, Pennsylvania, and Palestine, Texas, 16th; Fort Wayne, Indiana, and Independence, Iowa, 17th; Allison, Kansas, 18th; Factoryville, New York, University of Virginia, Virginia, and Fort Assinaboine, Montana, 19th; Webster, Dakota, 21st to 25th; Buckfield and Portland, Maine, and Fall River, Massachusetts, 22d; Bismarek, Dakota, Fort Scott, Kansas, and Manistique, Michigan, 23d; Fort Buford, Dakota, and North Platte, Nebraska, 23d, 24th; Palermo, New York, 26th, Poplar River, Montana, 27th; Albany, Oregon, 29th, 30th, 31st; Red Bluff, California, 30th; Moorhead, Minnesota, 31st.

Geese flying southward.—Rio Grande City, Texas, 4th; Wyandotte, Kansas, and Indianola, Texas, 5th; Independence, Kansas, 7th; Yates Centre, Kansas, 9th; Muscatine, Iowa, 15th; Yankton, Dakota, 17th; Red Bluff, California, 29th, 31st; Independence, Iowa, 31st.

Geese flying eastward.—Allison, Kansas, 6th, 14th; Block Island, Rhode Island, 22d.

Geese flying westward.—Yuma, Arizona, 16th.

Ducks flying northward.—Yates Centre, Kansas, 1st, 15th; Anna, Illinois, 4th, 13th; Wakefield, Kansas, 5th, 6th, 14th; Corsicana, Texas, 7th; Yutan, Nebraska, 7th, 16th, 18th; Westmoreland, Kansas, 8th, 12th; Spartanburg, South Carolina, 12th; Salina, Kansas, 13th, 15th, 18th, 23d; Wellsborough, Pennsylvania, 16th; Saint Vincent, Minnesota, 18th; Fort Assinaboine, Montana, 21st, 29th; Portland, Maine, 22d; Fort Buford, Dakota, 23d, 24th.

Ducks flying southward.—Muscatine, Iowa, 15th; Buckfield, Maine, 24th; Bismarek, Dakota, 27th; Indianola, Texas, 28th; Independence, Iowa, 31st.

Ducks flying westward.—Manchester, Iowa, 19th.

Cranes flying northward.—Salina, Kansas, 13th, 15th, 18th, 23d; Yutan, Nebraska, 17th; Yates Centre, Kansas, 24th.

Swans flying northward.—Yutan, Nebraska, 19th.

Meteorological record of voluntary observers and Army post surgeons, March, 1886.

The maximum and minimum temperatures at stations marked thus (*) are from readings of other than standard instruments.

Stations.	Temperature.				Stations.	Temperature.			
	Maximum.	Minimum.	Mean.	Rainfall.		Maximum.	Minimum.	Mean.	Rainfall.
<i>Alabama.</i>	o	o	c	<i>Inches</i>	<i>California—Cont'd.</i>	o	o	o	<i>Inches</i>
Birmingham *	76	23	54.2	11.51	San Rafael	81	31	50.6	3.12
Greensborough	78	34	57.2	11.72	Santa Barbara	71	35	53.1	2.03
Mount Vernon B'ks.	78	32	58.5	7.59	Susanville	66	26	39.0	3.00
<i>Arizona.</i>					<i>Colorado.</i>				
Huachuca, Fort	81	25	49.8	0.20	Colorado Springs	69	—4	34.0	0.39
McDowell, Fort	88	29	55.4	1.12	Lyon, Fort	80	4	40.6	0.28
Verde, Fort	79	26	47.7	1.20	Pueblo	78	9	40.1	0.46
<i>Arkansas.</i>					Salida	62	0	32.5	0.17
Lead Hill *	88	24	46.4	4.87	<i>Connecticut.</i>				
<i>California.</i>					Bethel	—	—	—	3.55
Alcatraz Island	68	41	51.2	1.52	North Colebrook *	59	—10	27.9	2.59
Angel Island	80	40	53.8	1.75	Voluntown	54	1	—	3.95
Benicia Barracks	71	42	52.0	2.28	<i>Dakota.</i>				
Bidwell, Fort	62	20	38.1	0.78?	Abr. Lincoln, Fort	64	—22	23.8	0.88
Blue Lake *	71	26	43.1	6.51	Pembina, Fort	42	—15	16.9	0.35
Cahuenga	—	—	—	2.61	Randall, Fort	69	—5	30.0	1.50
Fall Brook *	76	39	52.6	4.70	Richardton	52	—13	24.7	1.00
Gaston, Fort	80	27	49.3	2.38	Sisseton, Fort	61	—12	23.4	0.55
Hydoville	—	—	—	3.13	Sully, Fort	77	—9	30.0	0.80
Mason, Fort	69	47	56.8	1.74	Totten, Fort	43	—13	18.5	0.73
Muriotta *	80	30	49.9	5.94	Vermillion *	58	—10	29.0	2.40
Nicolaus *	76	38	52.4	1.50	Webster	69	—9	28.6	2.02
Oakland	72	25	51.3	2.57	Yates, Fort	67	—20	26.9	0.68
Oroville *	75	40	55.2	2.70	<i>District of Columbia.</i>				
Poway *	73	40	52.0	3.24	Distributing Res'r	70	17	43.1	4.72
Presidio of San F	74	37	51.7	1.92	Kendall Green	66	15	41.1	4.04
Princeton *	73	34	52.9	0.92	Receiving Res'r	68	14	42.4	4.58
Sacramento *	78	34	52.6	2.33	Rock Creek Bridge	72	19	45.6	—
Salinas	68	35	49.2	2.16					